ing the counties of Lewis, northern Herkimer, southern Franklin, and the northwestern part of Essex, and probably Hamilton." The sediment consisted principally of finely divided earth or vegetable mold, and no doubt closely resembled that collected by our correspondent at Pawpaw, Mich., on February 16, last.

Colored snow has been observed from very early times. In the American Almanac for 1833, p. 65, is a translation from Pouillet's Meteorologie of 1828 which credits Pliny (Book IX, chap. 35) with the statement that snow becomes red with age, and Mr. Francis Bauer with the discovery that the red color of the snow is due to the growth of "little mushrooms of the genus *uredo*, forming a peculiar species which he calls *uredo nivalis*, because snow is their natural soil."

In the American Journal of Science and Arts for 1841, vol. 41, p. 64, is a synopsis of a communication by Prof. Louis Agassiz on *animals found in red snow*. "He stated that Shuttleworth had lately demonstrated that besides the *Protococcus nivalis*, the red snow contained several species of *infusoria*. The results of Professor Agassiz's observations led him to conclude that the red snow was altogether an animal production, and that the so-called *Protococcus nivalis* is the ova of a species of rotiferous animal called by Ehrenberg *Philodina roseola*. This animalculae he had found dead in the red snow, and abundantly in the ditches in the neighborhood, at the bottom of which its ova produced a red deposit. Under the microscope the colored ova in the ovaries could be distinctly observed. He has also seen the infusoria described by Shuttleworth."

From the same journal for 1852, 2d series, Vol. XIII, p. 442, we quote the following: "Observations on a red snow which fell in Switzerland on the 3d and 4th of February;" by M. Ehrenberg. (Monatsber. Berlin Acad., March 6:)

> This red snow covered a large extent of country, including the cantons and districts of Zurich, Berne, Schwyz, Lugano, Bergamo, and Milan. It afforded a red precipitate, which yielded on analysis a large quantity of lime and silica, a little alumina, and some iron and magnesia. Microscopically examined, it was found by Ehrenberg to contain sixty-three organic forms, allied to those heretofore found by him in atmospheric dust, without any marine species.

In his American Weather, p. 74, Gen. A. W. Greely has the following to say of Arctic snows:

> Green and red snow are to be found in a few parts of the world, principally in the Arctic regions, the color being due to minute organisms called *Protococcus nivalis*. The most extensive deposits of red snow known, situated near Cape York, Greenland, were discovered by Capt. John Ross, R. N., in 1818, from whom the hills, owing to this snow, received the fanciful name of Crimson Cliffs. The color, however, as seen by the author, is a faint, dirty, dull red, and not crimson.

The MONTHLY WEATHER REVIEW for March, 1879, p. 16, states that—

> A microscopic examination of the yellow snow which fell at South Bethlehem, Pa,, on the 16th of that month disclosed the fact that the color was due to the presence of the pollen of pine trees that were then in bloom throughout the States farther south.

An extensive investigation of the black snow of January, 1895, will be found in the MONTHLY WEATHER REVIEW for that month (Vol. XXIII, pp. 15–19), wherein it is shown that the black or brown snow was colored by the fine soil blown along on the gales that accompanied the storm.

In the same journal for August, 1901, p. 374, it has been shown that the autumn haze is undoubtedly due to the finest dust—

> Composed of one or all of the following substances, namely, fine particles of soil or the dead leaves of plants, or ashes from wood fires, salt from the ocean spray, the shells or scales from microscopic silicious diatoms, germs of fungi, spores of ferns, pollen of flowers, etc.

Aqueous vapor utilizes these minute dust particles as nuclei about which to condense, but they would of themselves hardly be sufficient to explain the dark color of the snowflakes. If, however, after the snowflakes had formed they fell through or with a cloud of dust, smoke, pollen, or any other powdery substance, the powder would no doubt settle with them and impart its own peculiar color to the fallen snow.

It thus appears that the colored snowfalls occasionally noted are to be attributed, not to meteoric dust, but to dust taken up into the air from the surface of our own planet. There is only one case fairly well established where the snow was darkened by dust (iron) that had come from outside the atmosphere. The minute organisms that sometimes impart color to the snow, and particularly in Arctic regions, require time for their development, and we would hardly expect them to be numerous in newly-fallen snow, although they undoubtedly multiply with great rapidity.—*H. H. K.*

ELECTRICAL PHENOMENA; INCANDESCENT CLOUDS.

In a letter dated Braidentown, Fla., August 28, 1901, Mr. H. H. Ten Broeck sends the following account of electrical phenomena observed by him:

> About 9 p. m. of May 30, 1901, I saw some clouds pulsating with light like that of an aurora. They were small and very thin, showing stars through them, and drifting slowly eastward, overhead. On turning from them for a few moments and looking at them again, I was surprised to find them almost invisible. In a few moments they became plainer, and I saw they were lambent like the streamers of an aurora. I watched them for several minutes, during which they varied in light about every fifteen seconds. I then noted a larger, much denser cloud about west-northwest 20°, which showed the same action of auroral light. A bank of clouds covered the whole northern sky to some 20° above the horizon; they were very bright, but showed no variation in their light. A few scattered clouds in the south also were free from variation. There was nowhere any trace of streamers. A violent storm followed the next night, which in eighteen hours discharged nearly 7 inches of rain, a very unusual amount for the time of year. I have nowhere seen its equal in nine years.
>
> I have also noted more lightning without thunder. I reported some instances a few months ago in the MONTHLY WEATHER REVIEW. I saw a flash recently going from one cloud to another. It was about two miles long and very bright. I expected a violent clap of thunder, but none came. I have often seen such discharges followed by loud thunder which sometimes lasts over a minute before it dies away.

The preceding observations by Mr. Ten Broeck seem especially interesting because they harmonize with several similar experiences by the Editor. Any one may frequently observe, at night during a storm, clouds floating along and becoming now bright and now dark—the different parts of the same cloud may be bright and dark alternately. It will be easy to perceive thereby that this cloud light is not reflected from terrestrial sources. There seems but one explanation: the cloud is under the influence of an electrical discharge and is rendered luminous by it. Either the cloud particles are incandescent, as in the ordinary incandescent electric light, or the air between the particles is incandescent, as in intense lightning and the ordinary arc lights; in either case we may speak of an *incandescent cloud*, as distinguished from the "phosphorescent," "iridescent," "fluorescent," "luminescent" clouds that have been observed very high in the atmosphere and which apparently become luminous by reflecting distant twilight.

Of the above four terms applied to these clouds, phosphorescent best describes the pure soft, pearly white tint, but for fear lest some may imagine that the presence and oxidation of phosphorous causes the light, the Editor prefers to use the term "pearly" cloud.

Now the incandescent cloud is certainly a true case of incandescence and merits spectroscopic study. It is also a step or phase in the series of phenomena that includes the aurora and the lightning, and, therefore, ought to be recorded by every voluntary observer. As the Editor has often shown, an auroral region is generally surrounded by regions in which

thunderstorms are taking place, but vice versa, thunderstorms are not necessarily accompanied by auroras, though they are attended on their outskirts by incandescent clouds and if clouds are wanting by discharges on telephone, telegraph and kite wires.—*C. A.*

FAKE FORECASTS.

From the Portland Telegram of November 7, 1901, we learn that many of the inhabitants of the town of Woods, on Nestucca Bay, Oreg., were greatly excited over the prediction by a local prophet of "a great tidal wave" for November 3, that was to sweep over the strip of low coast to the mountains, carrying destruction in its path. The absurdity of such forecasts should at once be apparent, since waves properly designated as *tidal* are entirely dependent upon the character of the tides, whether spring or neap, and full information in regard to them is published months in advance by the United States Hydrographic Office. Storm waves, on the other hand, are a phenomenon accompanying severe storms, which latter almost never approach our coasts without ample warning from the United States Weather Bureau. We are, therefore, in danger of being taken unawares by earthquake or seismic waves only, and no one is as yet able to forecast these except possibly a few hours ahead, as when the operators of telegraphs and cables notify each other. An ocean wave produced by an earthquake on the coast of Japan or in the Philippines would require several hours to reach the American coast, and its arrival might safely be anticipated after receiving cablegrams announcing the passage of the earthquake itself. See the MONTHLY WEATHER REVIEW, November, 1895, p. 424, "The Storm Wave at Sausalito," where the speed of earthquake ocean waves is given.

Newspapers must be allowed the freedom of printing whatever they choose, but certainly the public may learn to read these thrilling fake predictions of storms and waves with perfect equanimity.

But these predictions appear in a different aspect when they issue from a voluntary observer of the United States Weather Bureau. The province of a voluntary observer is to observe, record, and report, but not to predict. The moment he appears before the public with a forecast of waves or of earthquakes, that moment he endangers his position as observer. It is possible that the Weather Bureau may need him and employ him as an "official forecaster" if he has great gifts in that line, but it is not probable that it will ever recognize him as a "voluntary forecaster." Is there not an explicit statute dealing with nonofficial forecasters?—*C. A.*

PROF. LUIGI PALAZZO.

By a royal decree, dated July 28, 1901, Prof. Luigi Palazzo was appointed Director of the Central Office of Meteorology and Geodynamics at the Colegio Romano, Rome, Italy, as a result of the competition proclaimed by the Minister of Agriculture, to fill the position made vacant by the retirement of the eminent Prof. Pietro Tacchini, who founded and directed said office with so much success for more than twenty years.

CORRIGENDA.

MONTHLY WEATHER REVIEW for September, 1901, p. 410, column 1, line 22, for "material" read "cloud observations;" line 23, for "observations" read "these."

THE WEATHER OF THE MONTH.

By ALFRED J. HENRY, Professor of Meteorology.

CHARACTERISTICS OF THE WEATHER FOR OCTOBER.

The chief characteristics of the month were dryness and clear skies. From the 18th to the 26th the skies were clear in all parts of the country, and there was practically no rainfall, except on the southeastern coast of Florida and locally in Upper Michigan. During this time an area of high pressure covered the country, stretching from the Atlantic to the Pacific. It is very unusual to chart the weather conditions of the United States for a single day without recording a trace of rainfall in any portion, and still more remarkable that an entire week should pass without a measurable amount of rain falling, except on the southeastern coast of Florida and a few sprinkles in Upper Michigan.

PRESSURE.

The distribution of monthly mean pressure is graphically shown on Chart IV and the numerical values are given in Tables I and VI.

Monthly mean pressure was highest over the Appalachian region in West Virginia, Virginia, the western portion of North Carolina, and eastern Tennessee; it was lowest north of Montana and over the Southwest. As compared with monthly mean pressure for the previous month, there was a marked rise, amounting in some cases to two-tenths of an inch and over. The greatest change occurred in the middle Rocky Mountain region and generally throughout the Southwest. Monthly mean pressure was one-tenth of an inch above normal from the Ohio Valley eastward to the Atlantic coast. It was also generally above the normal in the remaining districts east of the Rocky Mountains. The only negative departures recorded during the month were on the north Pacific coast and in the Plateau region.

TEMPERATURE OF THE AIR.

The distribution of monthly mean surface temperature, as deduced from the records of about 1,000 stations, is shown on Chart VI.

The month was warmer than usual in practically all districts. The greatest positive departures were noted in Montana and the British Possessions. Positive departures of from 4° to 6° were also recorded from the Mississippi Valley westward to the eastern foothills of the Rocky Mountains and on the northern Plateau and north Pacific coast. Negative departures were recorded at less than a dozen stations and the deficiencies in these cases were generally less than a degree.

The average temperature for the several geographic districts, and the departures from the normal values are shown in the following table: